Weill Cornell Medicine-Qatar
Continuing Professional Development

CERTIFICATE IN THE ANALYSIS OF MEDICAL DATA: APPLIED BIOSTATISTICS FOR HEALTH CARE PROFESSIONALS

CERTIFICATE IN THE ANALYSIS OF MEDICAL DATA: APPLIED BIOSTATISTICS FOR HEALTH CARE PROFESSIONALS

January 12 & 13, 2024
Introductory Applied Biostatistics for Health Care Professionals

February 3, 2024
Intermediate Applied Biostatistics for Health Care Professionals

March 2, 2024
Advanced Applied Biostatistics for Health Care Professionals

Overview

Certificate in the Analysis of Medical Data: Applied Biostatistics for Health Care Professionals

Description:
This is a series of three workshops (introductory, intermediate and advanced) aimed at enabling health care professionals (HCP) to organize, manage, and analyze their data and properly interpret and summarize its results. The workshops will be applied in nature where biostatistical concepts will be explained through case studies using a statistical software package, such as IBM-SPSS.

Gap Analysis/ Need Assessment
Research is the main pillar for the advance of science and the improvement of healthcare for patients. Biostatistics plays a key role in research. Biostatistics is taught for students in many disciplines, such as business, engineering, social sciences, nursing, allied health, pharmacy and medicine. Healthcare workers from all disciplines and all levels are expected to participate in or read about research at some point in their career. A major obstacle for people undertaking research is the inability to find help with data analysis (DeMets et al, 2006). Moreover, inadequate knowledge of biostatistical methods and interpretation might yield sub-optimal and possibly incorrect results. It is thus important to have proper and continuous post-university training for doctors and healthcare professionals in biostatistics and its concepts (Okoro et al 2019, Ercan et al 2008). Researchers from different disciplines in Qatar, as represented by scientific committee members of this course, have indicated that training in applied biostatistics is needed for students, faculty members and healthcare practitioners in the various health sectors in Qatar. This training will help researchers in Qatar improve their skills in research by being able to organize, manage and analyze their data. This could help increase research output in Qatar, with healthcare professionals equipped with the ability to analyze their data with minimal help, if any, from biostatisticians.

Overall Learning Objectives:
At the end of the three workshops, participants will be able to:

1. Enter and manage data using a statistical software
2. Perform bivariate analysis for both continuous and dichotomous outcomes
3. Perform multivariate analysis for both continuous and dichotomous outcomes
4. Perform simple analysis for survival data

Target Audience
Physicians, Nurses, Dentists, Pharmacists, Allied Health Professionals, Students, Researchers, Educators.

Accreditation

Disclosure of Relationships/Content Validity

It is the policy of Weill Cornell Medicine-Qatar to adhere to Ministry of Public Health's Department of Healthcare Professions (DHP) and Accreditation Council for Continuing Medical Education (ACCME) Criteria, Policies, and Standards for Commercial Support and content validation in order to ensure fair balance, independence, objectivity, and scientific rigor in all its sponsored programs. All faculty participating in sponsored programs are expected to disclose relevant financial relationships pertaining to their contribution to the activity, and any discussions of off-label or investigational uses of approved commercial products or devices, or of any products or devices not yet approved in the United States and elsewhere. WCM-Q CME/CPD activities are intended to be evidence-based and free of commercial bias.

Course Directors	Scientific Planning Committee
Thurayya Arayssi, MD Ziyad R Mahfoud, PhD	Mohammed Al-Saey, DDS Deema Al-Sheikhly, MEHP Nabila Chaabna, MSN Maguy S El Hajj, PharmD Stella Major, MD Daniel Rainkie, PharmD Vinoop Viswanathan, PT
Course Faculty	**Course Administrator**
Ziyad R. Mahfoud, PhD Soha Dargham, MPH Laudy Mattar, MMI Padmakumari Sarada, MSc	Safia Rabia

The Course Director & Co-course Director, Scientific Planning Committee members, Faculty and Course Administrator:

- Have no relevant financial relationship to disclose.
- Will not be discussing unlabeled/unapproved use of drugs or products.

Evaluation

An evaluation will be conducted online post activity. All participants are required to complete the Evaluation Form in order to qualify for a certificate. The evaluation allows us to assess the degree to which the activity met its objectives. It will also guide the planning of future activities and inform decisions about improving the educational program.

Accreditation and Credit Designation Statements

ACCME
The Weill Cornell Medicine-Qatar is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians

Introductory Applied Biostatistics for Healthcare Professionals
The Weill Cornell Medicine-Qatar designates this live activity for a maximum of 10.00 *AMA PRA Category 1 Credits*™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Intermediate Applied Biostatistics for Healthcare Professionals
The Weill Cornell Medicine-Qatar designates this live activity for a maximum of 6.50 *AMA PRA Category 1 Credits*™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Advanced Applied Biostatistics for Healthcare Professionals
The Weill Cornell Medicine-Qatar designates this live activity for a maximum of 7.00 *AMA PRA Category 1 Credits*™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

DHP
Weill Cornell Medicine-Qatar is accredited as a provider of Continuing Medical Education (CME) and Continuing Professional Development (CPD) by the Department of Healthcare Professions (DHP) of the Ministry of Public Health.

Introductory Applied Biostatistics for Healthcare Professionals
This activity is an Accredited Group Learning Activity (Category 1) as defined by the Department of Healthcare Professions -Accreditation Section and is approved for a maximum of 10.00 hours.

Intermediate Applied Biostatistics for Healthcare Professionals
This activity is an Accredited Group Learning Activity (Category 1) as defined by the Department of Healthcare Professions -Accreditation Section and is approved for a maximum of 6.50 hours.

Advanced Applied Biostatistics for Healthcare Professionals
This activity is an Accredited Group Learning Activity (Category 1) as defined by the Department of Healthcare Professions -Accreditation Section and is approved for a maximum of 7.00 hours.

The scientific planning committee has reviewed all disclosed financial relationships of speakers, moderators, facilitators and/or authors in advance of this CPD activity and has implemented procedures to manage any potential or real conflicts of interest.

Scientific Planning Committee

Course Directors

Thurayya Arayssi, MD

Vice Dean for Academic and Curricular Affairs
Professor of Clinical Medicine
Weill Cornell Medicine-Qatar

Ziyad R. Mahfoud, PhD

Professor of Research in Population Health Sciences
Weill Cornell Medicine-Qatar

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Lecturer, Faculty of Pharmaceutical Sciences
The University of British Columbia, Vancouver Campus – Canada

Vinoop Viswanathan, PT

Physiotherapist
Al Ahli Hospital

Program

Online via Zoom and Face-to-Face at WCM-Q
January 12-13, 2024

Introductory Applied Biostatistics for Health Care Professionals

Learning Objectives:
At the end of this activity, participants will be able to:

1. Use IBM SPSS to enter, code and manage data
2. Summarize variables both in numbers and graphs
3. Use IBM SPSS to apply basic analysis of numeric outcomes and categorical outcomes

Agenda

Time	Topic	Session Learning Objectives	Speaker
Day 1 (Friday)			
1:30 pm - 2:00 pm	Opening Remarks, Accreditation and Pre-test	Identify current knowledge pertaining to basics of applied biostatistics.	**Prof. Ziyad R. Mahfoud**
2:00 pm - 3:30 pm	Creating a Data Base in IBM-SPSS	At the end of this session, participants will be able to: 1. Demonstrate an understanding of IBM-SPSS software interface. 2. Create a data base in IBM-SPSS. 3. Produce data for different types of variables.	**Prof. Ziyad R. Mahfoud** **Facilitators:** **Ms. Padmakumari Sarada** **Ms. Laudy Mattar**
3:30 pm - 4:00 pm	Break		
4:00 pm - 5:30 pm	Descriptive Statistics in IBM-SPSS	At the end of this session, participants will be able to: 1. Compute descriptive statistics. 2. Demonstrate how to stratify analysis. 3. Demonstrate how to select a certain group of patients from a data base	**Prof. Ziyad R. Mahfoud** **Facilitators:** **Ms. Padmakumari Sarada** **Ms. Laudy Mattar**
Day 2 (Saturday)			
9:00 am – 10:30 am	Basic Data Management and Graphical Display of your Data in IBM-SPSS	At the end of this session, participants will be able to: 1. Generate data by creating new variables, recoding variables, and do data arithmetic. 2. Illustrate data using appropriate graphs.	**Prof. Ziyad R. Mahfoud** **Facilitators:** **Ms. Padmakumari Sarada** **Ms. Laudy Mattar**
10:30 am – 11:00 am	Coffee break		
11:00 am – 1:15 pm	Analysis of Numeric Outcomes in IBM-SPSS	At the end of this session, participants will be able to: 1. Compute confidence interval for one mean and difference between two independent means. 2. Analyze data using one sample t-test, paired t-test and independent t-test.	**Prof. Ziyad R. Mahfoud** **Facilitators:** **Ms. Padmakumari Sarada** **Ms. Laudy Mattar**
1:15 pm – 2:15 pm	Lunch break		
2:15 pm – 3:30 pm	Analysis of Dichotomous or Categorical Outcomes in IBM-SPSS	At the end of this session, participants will be able to: 1. Compute the confidence interval for a proportion and difference between two independent proportions. 2. Analyze data using binomial test, Chi-squared test, Fisher's exact test, McNemar's test.	**Prof. Ziyad R. Mahfoud** **Facilitators:** **Ms. Padmakumari Sarada** **Ms. Laudy Mattar**
3:30 pm – 4:00 pm	Coffee break		
4:00 pm – 5:00 pm	Case-study: Analysis for a 2 Parallel Arm Clinical Trial	At the end of this session, participants will be able to: 1. Create suitable demographic and clinical characteristic summary table for a clinical trial. 2. Produce the most appropriate analysis for the outcomes in a 2 parallel arm clinical trial.	**Prof. Ziyad R. Mahfoud** **Facilitators:** **Ms. Padmakumari Sarada** **Ms. Laudy Mattar**
5:00 pm – 5:30 pm	Wrap up and Post-test	1. Evaluate to which extent the learning objectives were met. 2. Summarize the key learning points.	**Prof. Ziyad R. Mahfoud**

Program

Online via Zoom and Face-to-Face at WCM-Q
February 3, 2024

Intermediate Applied Biostatistics for Health Care Professionals

Overall Learning Objectives:

At the end of this activity, participants will be able to:

1. Develop a linear regression model to examine the relationship between a numeric dependent variable and one or more independent variables
2. Develop a logistic regression model to examine the relationship between a dichotomous dependent variable and one or more independent variables
3. Test for interaction in regression
4. Assess confounding in regression

Agenda

Time	Topic	Session Learning Objectives	Speaker
9:00 am – 9:15 am	Pre-test	Identify current knowledge pertaining to biostatistical concepts that will be covered in the current training	**Prof. Ziyad R. Mahfoud**
9:15 am – 10:15 am (60 min)	Review material from first training a. Descriptive statistics b. Analysis of numeric variables c. Analysis of categorical variables	At the end of this session, participants will be able to: 1. Compute descriptive statistics 2. Demonstrate an understanding of analysis of numeric and categorical variables	**Prof. Ziyad R. Mahfoud** **Facilitator:** **Ms. Soha Dargham**
10:15 am – 11:45 am (90 min)	Introduction to Regression a. Simple linear regression b. Simple logistic regression	At the end of this session, participants will be able to: Apply a simple linear regression and simple logistic regression to analyze their data	**Prof. Ziyad R. Mahfoud** **Facilitator:** **Ms. Soha Dargham**
11:45 am – 12:15 pm	Break		
12:15 pm – 1:15 pm (60 min)	Important concepts in Regression a. Confounding b. Interaction c. Overfitting or underfitting in regression	At the end of this session, participants will be able to: 1. Demonstrate an understanding of how to account for confounding variables in regression 2. Demonstrate an understanding of interaction and how to test for it in regression 3. Demonstrate an understanding of overfitting and underfitting in regression	**Prof. Ziyad R. Mahfoud** **Facilitator:** **Ms. Soha Dargham**
1:15 pm – 2:15 pm	Lunch break		
2:15 pm – 3:30 pm (75 min)	Multiple linear regression a. Analysis of the full Model b. Confounding interaction and collinearity in linear regression	At the end of this session, participants will be able to: 1. Employ multiple linear regression to analyze a full model. 2. Demonstrate an understanding of confounding, interaction and collinearity in linear regression	**Prof. Ziyad R. Mahfoud** **Facilitator:** **Ms. Soha Dargham**
3:30 pm – 4:00 pm	Break		
4:00 pm – 5:15 pm (75 min)	Multiple logistic regression a. Analysis of the full Model b. Confounding interaction and collinearity in logistic regression	At the end of this session, participants will be able to: 1. Employ multiple logistic regression for the analysis of the full model 2. Demonstrate an understanding of confounding, interaction and collinearity in logistic regression	**Prof. Ziyad R. Mahfoud** **Facilitator:** **Ms. Soha Dargham**
5:15 pm – 5:30 pm	Wrap up and post-test	1. Evaluate to which extent the learning objectives were met 2. Summarize the key learning points	**Prof. Ziyad R. Mahfoud**

Program

Online via Zoom OR Face-to-Face at WCM-Q
Mar 2, 2024

Advanced Applied Biostatistics for Health Care Professionals

Overall Learning Objectives:
At the end of this activity, participants will be able to:

1. Generate a multiple linear regression
2. Generate a multiple logistic regression
3. Analyze data from a one-way ANOVA
4. Analyze data using nonparametric statistics
5. Generate a Kaplan Meier Curve and compute median survival
6. Interpret Hazard Ratios and their confidence intervals

Agenda

Time	Topic	Session Learning Objectives	Speaker
9:00 am – 9:30 am	Pre-test	Identify current knowledge pertaining to biostatistical concepts that will be covered in the current training.	**Prof. Ziyad R. Mahfoud**
9:30 am – 10:45 am (75 min)	Review material from first and second training a. Descriptive statistics b. Analysis of numeric variables c. Analysis of categorical variables	At the end of this session, participants will be able to: 1. Compute descriptive statistics. 2. Demonstrate an understanding of analysis of numeric and categorical variables. 3. Employ multiple linear regression to analyze a full model. 4. Employ multiple logistic regression to analyze a full model.	**Prof. Ziyad R. Mahfoud** **Facilitator:** **Ms. Soha Dargham**
10:45 am – 12:15 am (90 min)	Selecting variables for multiple regression a. Computer based methods b. Other methods c. Application	At the end of this session, participants will be able to: 1. Employ forward, backward and stepwise methods of variables selection for linear and logistic regression models. 2. Employ other methods of variables selection for linear and logistic regression.	**Prof. Ziyad R. Mahfoud** **Facilitator:** **Ms. Soha Dargham**
12:15 pm – 12:30 pm	Break		
12:30 pm – 1:30 pm (60 min)	One way ANOVA a. Understanding the ANOVA table b. Multiple testing model c. How does it work with categorical variables	At the end of this session, participants will be able to: 1. Employ one-way ANOVA and multiple testing procedures for numeric variables. 2. Employ Chi-squared test for multiple groups with pairwise comparison procedures.	**Prof. Ziyad R. Mahfoud** **Facilitator:** **Ms. Soha Dargham**
1:30 pm – 2:30 pm	Lunch Break		
2:30 pm – 3:45 pm (75 min)	Nonparametric tests a. For bivariate analysis b. For one way ANOVA	At the end of this session, participants will be able to: 1. Demonstrate an understanding of the difference between parametric and non-parametric tests. 2. Apply nonparametric tests such as Wilcoxon's signed rank test, rank sum test, and the Kruskal Wallis test.	**Prof. Ziyad R. Mahfoud** **Facilitator:** **Ms. Soha Dargham**
3:45 pm – 4:00 pm	Break		
4:00 pm – 5:15 pm (75 min)	Introduction to Survival Analysis a. Kaplan Meier Method and Curve b. Log Rank test and Hazard Ratio	At the end of this session, participants will be able to: 1. Demonstrate an understanding of the concept of time to event and censoring. 2. Apply Kaplan Meier method to obtain survival estimates and curves. 3. Employ the log rank test. 4. Demonstrate an understanding of the concept of hazard ratio.	**Prof. Ziyad R. Mahfoud** **Facilitator:** **Ms. Soha Dargham**
5:15 pm – 5:30 pm	Wrap up and post-test	1. Evaluate to which extent the learning objectives were met. 2. Summarize the key learning points.	**Prof. Ziyad R. Mahfoud**

Faculty

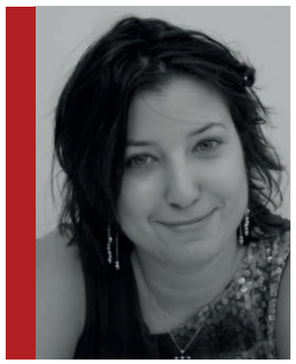
Ziyad R. Mahfoud, PhD

Professor of Research in Population Health Sciences
Weill Cornell Medicine-Qatar

Dr. Ziyad Mahfoud joined Weill Cornell Medicine-Qatar (WCM-Q) in 2010 and currently holds the position of professor of research in population health sciences.
Dr. Mahfoud received his PhD in statistics from the University of Florida and has taught at both the University of Kentucky and the American University of Beirut.

The principal focus of Dr. Mahfoud's work is the design and analysis of epidemiological and interventional studies, and he is also an expert in clinical trials. To date, Dr. Mahfoud has more than 150 peer-reviewed articles to his name, published with local and international collaborators on a diverse range of topics. He has also served as advisor and consultant to several pharmaceutical companies and international organizations including WHO, UNAIDS, IOM, and UNICEF.

In the past 20 years, Dr. Mahfoud has worked all over the world, delivering training in the fields of biostatistics, scientific writing, and research methodologies. He has won numerous teaching awards in recognition of his ability to make biostatistics easily comprehensible.



Soha Dargham, MPH

Senior Biostatistician
Weill Cornell Medicine-Qatar

Soha Dargham is a Senior Biostatistician at Weill Cornell Medicine-Qatar. She is the lead statistician for several ongoing projects and has presented several introductory biostatistics workshops for research staff and medical interns. Her aims as a biostatistician and researcher have been to deliver high-quality statistical analyses and results while also aspiring to be a product-oriented researcher.

Having spent more than seven years in the research industry, Soha research skills and acquired knowledge are used in ways that improve, promote, and expand the research.
She enjoys translating the numbers and data statistics into stories and identifying research priorities, which in turn can be used by clinicians, health policy makers, and the public to make evidence-based decisions in the realm of public health.

Soha earned her BSc from the University of Wisconsin-Madison, USA, and her MPH from the American University of Beirut, Lebanon. She is fluent in English, Arabic and French.

Padmakumari Sarada, MSc

Teaching Specialist in Math and Statistics
Weill Cornell Medicine-Qatar

Ms. Sarada is a Teaching Specialist in Math and Statistics at Weill Cornell Medicine-Qatar and previously served as Learning Lab Specialist in Science program at Texas A&M-Qatar.

She holds Masters in Statistics, Masters in Mathematics, and Bachelors in Education from Kerala University, India.

Ms. Sarada is currently pursuing Ph.D. in Education at Richard W Riley College of Education & Leadership, U.S.A.

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